What is claimed is:

1. A field emission display comprising:

at least a cathode electrode;

at least a carbon nanotube array having an end surface adapted for emission of electrons therefrom;

an anode electrode;

at least a gate electrode arranged between the at least a cathode electrode and the anode electrode;

a spacer adapted for insulating the at least a cathode electrode and the at least a gate electrode;

wherein each carbon nanotube array is in electrical connection with a corresponding cathode electrode, and the end surface of the carbon nanotube array is substantially flush with an end of the spacer.

2. The field emission display as described in claim 1, wherein a material of the spacer is selected from the group consisting of heatproof glass, metal coated with insulating material, silicon, silicon oxide, mica and ceramic material.

3. The field emission display as described in claim 2, wherein a height of the spacer is in the range from 1 micron to 10 mm.

4. The field emission display as described in claim 1, wherein each carbon nanotube array is connected to the corresponding cathode electrode via a layer of negative feedback resistance, which is formed between the carbon nanotube

array and the cathode electrode.

5. The field emission display as described in claim 1, wherein the at least a gate electrode is offset in relation to the at least a carbon nanotube array.

6. The field emission display as described in claim 1, wherein the at least a gate electrode is connected with the spacer via a thin layer of insulative material.

7. A field emission display comprising:

at least a cathode electrode;

an anode electrode;

at least a gate electrode arranged between the cathode electrodes and the anode electrode;

at least a carbon nanotube array, each electrically connected to a corresponding cathode electrode; and

a spacer insulatively separating the gate electrodes from the cathode electrodes;

wherein an end surface of each carbon nanotube array is flush with a top end of the spacer nearest the gate electrodes; and an intermediate layer having a predetermined thickness is arranged between the gate electrodes and the spacer.

8. The field emission display as described in claim 7, wherein a material of the

intermediate layer is selected from the group consisting of heatproof glass, metal coated with insulating material, silicon, silicon oxide, mica and ceramic material.

9. The field emission display as described in claim 8, wherein a thickness of the intermediate layer is in the range from 1 micron to 1000 microns.

10. The field emission display as described in claim 7, wherein a material of the spacer is selected from the group consisting of heatproof glass, metal coated with insulating material, silicon, silicon oxide, mica and ceramic material.

11. The field emission display as described in claim 7, wherein a height of the spacer is in the range from 1 micron to 10 mm.

12. The field emission display as described in claim 7, wherein each carbon nanotube array is connected to a corresponding cathode electrode via a layer of negative feedback resistance.

13. The field emission display as described in claim 7, wherein a thin protective layer is arranged between the spacer and the intermediate layer.

14. The field emission display as described in claim 13, wherein a thickness of the thin protective layer is in the range from 10 nanometers to 1 micron.

15. The field emission display as described in claim 13, wherein a catalyst layer is arranged between the thin protective layer and the spacer.

16. The field emission display as described in claim 15, wherein a thickness of

the catalyst layer is in the range from 1 nanometer to 10 nanometers.

17. A field emission display comprising:

a cathode assembly;

a carbon nanotube array having a first end in electrical connection with the cathode assembly and a second end which is substantially planar;

a support member arranged adjacent the carbon nanotube array;

a gate electrode positioned on the support member; and

a phosphor screen assembly having an anode electrode facing the carbon nanotube array;

wherein the support member comprises an insulative spacer and an intermediate layer on a top of the insulative spacer, each of which having a predetermined thickness, and the second end of the carbon nanotube array is flush with a top end of the spacer.

18. The field emission display as described in claim 17, wherein the cathode assembly comprises a layer of negative feedback resistance.

19. The field emission display as described in claim 17, wherein a flatness of the carbon nanotube array is less than 1 micron.

20. The field emission display as described in claim 17, wherein the phosphor screen assembly comprises a phosphor layer.

21. The field emission display as described in claim 17, wherein the thickness of the intermediate layer is in the range from 1 micron to 1000 microns.

22. The field emission display as described in claim 17, wherein the support member further comprises a protective layer between the insulative spacer and the intermediate layer.

23. The field emission display as described in claim 22, wherein a thickness of the protective layer is in the range from 10 nanometers to 1 micron.

24. A filed emission display comprising:

at least a cathode electrode;

at least a carbon nanotube array having an end surface adapted for emission of electrons therefrom;

an anode electrode spaced from said end surface opposite to said cathode electrode;

at least a gate electrode arranged between the at least a cathode electrode and the anode electrode;

wherein each carbon nanotube array is in electrical connection with a corresponding cathode electrode, and carbon nanotubes include respective emission tips essentially flush with one another and defining said end surface of the carbon, and wherein

said emission tips are essentially root sections during growing of said carbon nanotube array.

25. The field emission display as described in claim 24, wherein a spacer is provided beside said carton nanotube array for supporting not only said cathode electrode during growth of said carbon natotube array, but also the gate electrode in a final assembly.